

## REMARKS

Claims 1-16 are presented for examination with claims 1-2, 4-6, 8, 10-12, and 14-16 being currently amended. Claims 3, 7, 9 and 13 are pending as previously presented.

Claims 1-2, 5-6, 8, 10-12 and 14-16 have been amended to correct the typographical error of “titaniumtetraalcoxide”. The correct spelling is “titaniumtetraalkoxide”. Claims 1 and 5 have been amended to contain the term “comprising” in compliance with the Office Action objection as to informalities. Minor clarifying amendments have also been made to claims 1 and 5. The amendments are supported by the claim themselves. No new matter has been added.

The specification has been amended at page 5 to change “ILLUSTRATION” to “DESCRIPTION”.

### Drawing objection

The Office Action objected to Fig. 5 because it is allegedly not legible. A new replacement Fig. 5 is submitted herewith. In view of the submission, the objection is requested withdrawn.

### 35 U.S.C § 102 (a or b) rejection

The Office Action rejected claims 1-16 as being anticipated by JP 2002-248163 (“JP ‘163”) because the reference allegedly teaches apatite being formed on the surface of a composition containing titanium gel polymer where the polymer is nylon-6, polyethylene or polyethylene terephthalate. However, the rejection is traversed because each and every claimed limitation of independent claim 1 is not taught by the cited reference. JP ‘163 fails to teach the claimed titania solution of claim 1 being obtained by adding a solution consisting of acidic alcohol and water into an

alcohol solution of titaniumtetraalkoxide  $\text{Ti}(\text{OCH}(\text{CH}_3)_2)_4$ , *e.g.* tetraisopropyltitanate (claim 2). Instead, JP '163 teaches the titanium source being an ammonium hexafluoro titanate  $((\text{NH}_4)_2\text{TiF}_6)$  being dissolved at a concentration of  $1 \times 10^{-1} \text{ mol/L}$  and boron being added and stirred quickly to a concentration of  $3 \times 10^{-1} \text{ mol/L}$ . See JP '163 at ¶ [0023], [0024]. The source of titanium in JP '163 is completely different from the claimed invention and one of ordinary skill in the art would not be motivated to use the claimed titaniumtetraalkoxide by its teachings.

Moreover, the claimed product-by-process limitations of claim 1 impart patentable distinction over known compositions by providing a safer, non-toxic product. When forming a bioactive layer on an organic polymer, known techniques require (1) the use of a polymer having an active group, or (2) the formation of an intermediate layer to facilitate the formation of a titanium dioxide layer on an organic polymer substrate like polyethylene. For example, JP 2002-325834<sup>1</sup> teaches surface-treating an organic polymer substrate with a cytotoxic silane coupling agent in order to form a titanium oxide layer while JP 2002-272835<sup>2</sup> teaches the formation of a titanium oxide layer on the surface of polyethylene or polyethyleneterephthalate using a highly toxic fluorotitan complex. Similarly, the cited reference JP '163 teaches the titanium source being an ammonium hexafluoro titanate  $((\text{NH}_4)_2\text{TiF}_6)$ . Obviously, such toxicity is unacceptable for *in vivo* use as an artificial bone material.

In contrast, the claimed invention recites titaniumtetraalkoxide  $\text{Ti}(\text{OCH}(\text{CH}_3)_2)_4$  such as tetraisopropyltitanate, which does not contain any fluoro compounds. This results in a safer and less toxic titanium oxide-organic material for artificial bone than those of the cited reference JP '163.

---

<sup>1, 2</sup> Cited in International Search Report

Conclusion

In light of the foregoing, it is submitted that the application is now in condition for allowance. It is therefore respectfully requested that the rejection(s) be withdrawn and the application passed to issue.

Respectfully submitted,

**HAHN & VOIGHT PLLC**

/Roger C. Hahn/

---

Attorney for Applicants  
Roger C Hahn  
Reg. No. 46,376